### Chemical Properties

- **Product Name:** (-)-Huperzine A
- **Cas No.:** 102518-79-6
- **M.Wt:** 242.3
- **Formula:** C15H18N2O
- **Synonyms:** Huperzine A, (5R,9R,E)-5-amino-11-ethyldene-7-methyl-5,6,9,10-tetrahydro-5,9-methanocycloocta[b]pyridin-2(1H)-one
- **Canonical SMILES:** C/C=C1[@@]2(N)C3=C(N(C=C3)=O)C[@/1([H])C=C(C)C2
- **Solubility:** $\geq 12.1$ mg/mL in DMSO
- **Storage:** Store at -20°C
- **General tips:** For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.
- **Shopping Condition:** Evaluation sample solution: ship with blue ice
  All other available size: ship with RT, or blue ice upon request

### Biological Activity

- **Targets:** Neuroscience
- **Pathways:** Alzheimer
- **Description:**

  (-)-Huperzine A (HupA) is an acetylcholinesterase (AChE) inhibitor with an IC50 value of 82 nmol/L [1] and acts as an antagonist of the N-methyl-d-aspartate (NMDA) receptor [2]. AChE is the key brain enzyme responsible for the rapid degradation of the neurotransmitter acetylcholine. AChE inhibitors are probably useful in the amelioration of the Alzheimer's symptomatology [3].

  It was found that NMDA markedly reduced AChE activities [4]. In rat dissociated hippocampal...
neurons, HupA inhibited the NMDA-induced current. In neurons, 100 µM HupA, NMDA-induced currents were 55.7 ± 4.9% of the control values. The binding molecular ratio of NMDA receptor: HupA is 1:1. The inhibition of NMDA receptor by HupA is not competitive [5]. HupA significantly increased the phosphorylation levels of both glycogen synthase kinase (GSK)-3α protein and GSK-3β protein in APPsw-overexpressing cells [2]. Activated GSK-3 consequently decreased acetylcholine (ACh) level in the striatum [6]. Treated with doses of (−)-huperzine A, AChE−/− mice showed no toxic symptoms and had normal levels of AChE. This demonstrated the specificity of (−)-huperzine A as an inhibitor of AChE at the dose used in vivo [7]. In rat whole brain, oral administration of HupA at a dose of 1.5 µmol/kg (3.6 mg/kg) obtained a maximum inhibition of AChE at 60 min and this maximum inhibition was maintained for 360 min [8].

Reference:
[7]. Ellen G. Duysen, Bin Li, Sultan Darvesh, et al. Sensitivity of butyrylcholinesterase knockout mice to (−)-huperzine A and donepezil suggests humans with butyrylcholinesterase deficiency may not tolerate these Alzheimer's disease drugs and indicates butyrylcholinesterase function in neurotransmission. Toxicology, 2007, 233:60-69.

Caution

FOR RESEARCH PURPOSES ONLY.

NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Shortterm
storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.